Identifying and Overcoming the Risk of Fraud in the Malaysian Electronic Land Administration System

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***Abstract*—This paper attempts to provide a brief research report in risk management and security areas pertaining to threats due fraud in the Malaysian Electronic land administration system. Analyses of potential threats are provided based on evidences from various past researches and working papers, documentations, and field visits. Based on the findings, the researchers classified and described fraud existence, and suggested means of which such threats can be reduced through appropriate use of technology, policies, and strategies.**

Keywords - fraud; land administration system; electronic land administration system; risk management; Malaysian Public Sector

I. INTRODUCTION

Land is a source of wealth and has continued to be a cause of social, ethnic, cultural and religious conflict from time immemorial. Thus, as society evolved, an effective land administration system is needed in order to meet the changing needs of the world societies. A good land registration system is pertinent to ensure protection of property rights. As society progressed and become more complex, so are the technology and innovations, which if correctly designed and applied, can significantly improve the business process in land administration system.

Recent years has seen the rapid improvement in Information and Communication Technologies (ICT) and increased reliance on its use in various sectors including banking, constructions, medicine, government services, etc. Such ICT use can also be observed in the field of conveyancing where many countries such as Australia, New Zealand, Canada, etc. are adopting to electronic land administration system or electronic conveyancing/registration system to effectively and efficiently manage land titling. The use of the technology is said to increase the speed of processing of various land dealings, improve the incidents of paper-based fraud, and therefore improve the overall economics in land market. A country like Malaysia has made efforts accordingly, to continuously reform its land administration system through its provision of law in the National Land Code and in the application ICT to achieve its objective of improving land market and sustainability.

Land-title registration is a critical starting point in land management. Registration of title to land identifies ownership of the parcel or plot of land, as well as other forms of tenure and interests on it, simplifies, cheapens and expedites land transactions and conveyancing and improves credit flow to land development, as well as facilitates more effective planning for orderly human settlement [5]. It is therefore, highly crucial that the system is designed to minimize incidents of fraud that can impose threat to the credibility of the government in ensuring the indefeasibility of title to land owners.

Accordingly, this article seeks to identify and discuss the risk of fraud in existing land administration system in Malaysia and recommend ways for which fraud can be overcome with through the use of electronic land administration system. The paper provides the analysis on the types of fraud that can be made possible through the existing partially manual and computerised system, and suggest ways for overcoming the fraud through the design of a good electronic land administration system in Malaysia. As part of the recommendation, suggestions for the potential reform to the government security strategies are also provided.

II. BACKGROUND

The Malaysian land administration system is based on the Torrens system. The Torrens Title System was first introduced in South Australia in 1858 and subsequently used in other Australian states and some parts around the world [19]. The main objective of the Torrens title system is to make the Register of documents of title conclusive evidence of land ownership. Once a person's title or interest is registered in accordance with the prescribed registration procedures, it will be recorded in the Register document of title, and the person in whose favour the dealing is registered will become the indefeasible proprietor or interest holder to the exclusion of all others.

A. *Definition of Fraud*

Low (2008) [13] defined fraud as activities involving some form of deceit, where there is an act of deliberate dishonesty or an intention to deceive and that there is lost suffered due to that deceit. In his description of fraud, Low identified fraud into the following:

- Forgery of signatures; fraudulent execution of the victim's signature on an instrument of mortgage;
- Fraudulent execution of a power of attorney and subsequent mortgaging of the family home using the power of attorney;
- Fraudulent person either fraudulent executing or coercing execution of a transfer of the subject property to the fraudulent person's wife/son/husband;
- Misleading the registered proprietor into signing mortgage documents over the subject property; impersonating the registered proprietor and fraudulently arranging for a mortgage to be registered over the subject land.

Besides Low (2008) [13], Maidin and Khadouf (2009) [14], Ismail (2008) [8] also discusses the concept of fraud from the legal and administration perspective in the context of Malaysian land administration system.

B. *The Signifcance of Understanding and Minimising Fraud*

Why is it important to minimise fraud in land administration? Low (2008) [13] acknowledged that the importance of providing the owners of land with secure title is vital for economic well-being and growth. The foundation of the Torren system of registration has been secure or indefeasible title, which is central in the system of registration. However, incident of fraud may have the effect of eroding the owners' security of title. The argument has been that this will lead to the loss of owner confidence in the Torren system's ability to provide security of title, which may result in the lack of confidence to associate themselves in behaviour related to ownership such as sales, rental, use as collateral, and upgrading investments [(Lanjouwv and Levy, 2004) [10].

Increasing cases of fraud in Malaysia and public awareness and pressure to the severity of the incidents have triggered the needs of the Ministry of the Natural Resources and Environment (NRE) to seek resolution to the issue. Among the resolutions include the investment of information technology through the design of electronic land administration system currently called *e-Tanah* (*Tanah* in Malay means Land), the revision of various work processes and procedures in land offices, and most recently, the effort taken to investigate the potential reform to the National Land Code 1965 in order to strengthen the current and future application of the electronic land administration system.

Many cases of fraud involving land transfer in Malaysia might have been left unreported or pending to court. While the fraudulent individuals can be brought to justice, the victims remain uncompensated for the lost that should have been guaranteed by the state [14]. The fact that Malaysia does not have any compensation scheme to the loss of property due to fraudulent act, the threat to the economic well being in the property market can be worsen. The government needs to take effective action by improving its land administration system to overcome the issue of fraud. It must be better prepared in assuring indefeasibility and safety of title through good design and implementation of the ICT application systems, the use of good risk management strategies, security policies, and procedures in the electronic environment.

III. METHODOLOGY

In this report, the authors seek to identify all potential fraud in the current land administration system in Malaysia through analysis of reports, literature, cases and field visits. Several field visits were conducted to several locations of both State and District Land Offices. Information from the field visits was gathered through focus groups and interviews.

Based on the identified cases of fraud, analyses are provided to describe and explain the nature of fraud and how it can be prevented or overcome with using a good design of electronic land administration system. In addition to the suggested strategies and design, the authors also seek to propose appropriate strategies that are needed for effective management and administration of electronic land administration system in the country.

IV. FINDINGS

A. *Types fraud identified*

Analysis of cases and police records has led to statistical reports to illustrate the cases of fraud in various states in Malaysia. A total of 313 cases of land related fraud was reported between 2005 until 2008 (Commercial Crime Department, Royal Malaysian Police Force**).** The highest cases were spotted in the areas of which the land value is found very high. The type of cases involving fraud were related to the use of forms (Form 14A) in dealing with land registration for the purpose of changing ownership (102 cases reported), the use of false title, identity and Sales and Purchase Agreement (50 cases), and the use of false Power of Attorney and Court Order (33 cases). Such fraudulent activities took place when the administration system is handled by both manual and computerised registration system. Arguably, such fraudulent activities were anticipated to be solved or reduced through a good design of electronic land administration system.

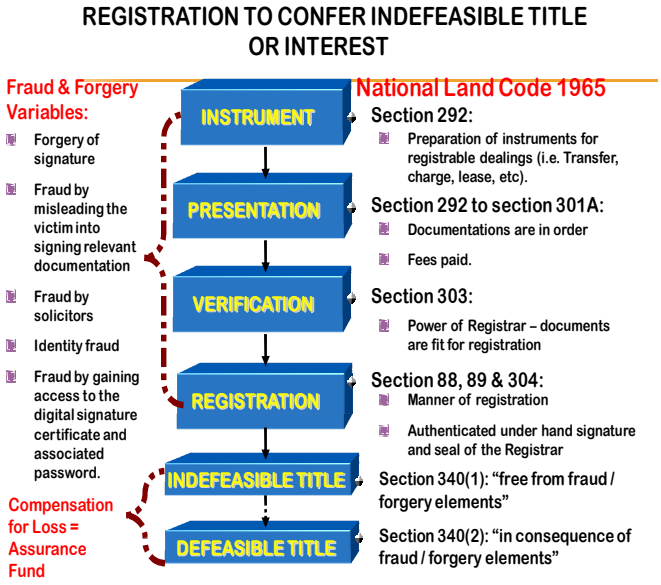
In brief, the flow of land title registration process begin with the use of forms (Form 14A) and the preparation

of related documents such as the original land titles, copies, legal documents, proof of identifications, payment receipts, etc. Once completed, the forms and the compiled documents are presented at the service counter, which is later verified. Once approved, the registration of title into a new owner name or charger (i.e. banker) can then take place accordingly. Once registered, the title is considered indefeasible, which grant a secured and absolute ownership to a person whose name being registered.

Ismail (2008) [8] illustrated the potential pattern of fraud through Figure 1 below. Accordingly, the pattern of fraud in land administration can be identified at each step in the process, along with the legal sanction provided through the NLC 1965, which can still be penetrated.

Based on the illustration in the figure, fraud can take the form of forgery of signature, fraud by misleading the victim into signing, fraud by solicitors, identity fraud, and fraud by getting access to the system through system password. All of these frauds can take place at different level in the process.

Figure 1



The detail illustration of fraud in the form of identity fraud is also provided further by Shukri (2011) [9]. The author illustrates the nature of fraud and the manner of which it can be perpetrated within both manual and electronic environment, giving special emphasis on the case of *e-Tanah*. *E-Tanah* is a system currently adopted by the Malaysian Government in an effort to transform current land administration system into fully integrated electronic environment.

On the other hand, based on the analysis from pass research and various documentations described above, the researchers further gathered evidences in an attempt to identify all potential frauds in land administration including those related to electronic administration system. These types of fraud are identified and further categorized into:

1. Fraud by forgery which comprise of
   - Forging of Transfer Form (i.e. form 14A) or Charge Form (i.e. Form 16A/B)
     - Forging of Signature
   - Registering Dealings Using Power of Attorney
     - Fraud by the solicitors at different authority level
   - Using Court Order to Register Dealings in Favour of Prospective Title or Interest Holders Without Verification of Validity
     - Validity of Court Order
   - Forging of signature or the power of attorney
2. Fraud by Misrepresentation
   - Presentation and Collection of Conveyancing Instruments by Unauthorised Persons
     - Fraud by False identity or imposter
3. Fraud by Alteration
   - Fraud by Land office administrator
   - Fraud By System Administrator
4. Fraud by Hackers who Compromise Network and System
5. Fraud by Credit Card Payment

Further investigations have been conducted to understand the nature of perpetration of each fraud and how the technology can be used to overcome the risk. In general, the perpetration of fraud can take various different forms and by various different individuals. Fraudulent activities can occur within both manual and electronic environments. The existing system does not provide sufficient mechanism to protect against these frauds or if there is any, such mechanism is still penetrable based on the statistical data provided by the Police Department.

There is no assurance as to the best risk management strategies and mechanisms applied. However, improvement can still be made by the Director General Office of Land and Mines (JKPTG) to improve the security of the land administration system databases and its processes. Therefore, much thought should be given in understanding how the risk can be reduced in the new electronic environment. Among the proposed strategies, processes and technical solution to the new electronic environment are comprised of the following:

Fraud by forgery

- Use of accurate and reliable authentication technique
- Shared responsibility and accountability by lawyers
- Additional client biometric authentication for consent
- Automatic notification to owners

Fraud by misrepresentation

- Shared responsibility and accountability by lawyers
- Additional client biometric authentication for consent
- Automatic notification to owners
- Use of Different authority level
- Use of strict authentication strategy
- Electronic Submission of instruments

Fraudulent alteration

- Use of different levels and layers of authority
- Incorporate all modules in land administrations that are integrated with fewer flaws in the processes and the procedures incorporated.

Fraudulent alteration by system administrator

- Application of security strategies on the following:
  Access Control
  - Use of dual factor authentication, for example a combination of what you know and what you have, to reduce the risk of stolen identity or forged identity
  - Limit administrative rights to database system requiring elevated rights to make changes to the database.
  - Restrict contractors from having full system access.
  - Monitoring of audit logs including logging transaction details such as account used for access, activities conducted on the system and the time the transaction occurred. These audit records need to be identified, stored, protected, retrieved, retained for a specific period of time and disposition of records shall be documented and implemented.

Fraudulent alteration by land administrator

- Access to the Land Office facility need to be protected with sufficient access control.
- Contractors' personnel requiring access to facility require validation.
- Use of Operational Security Controls for
  - Monitoring of audit logs including logging transaction details such as account used for access, what activities were conducted on the system and the time the transaction occurred.
  - Audit records are recorded at separate log server on the network, to avoid unauthorized access and tampering.
  - These records are to be made available to auditors during audit exercise.

Fraud by hackers

- Use of data Encryption in transit and in storage to avoid malicious program and prevent eavesdropping.
- Access to the Land Office facility need to be protected with sufficient access control.
- Contractors' personnel requiring access to facility require validation.

Fraud by credit card

- Implement secure protocol for credit card use such as 3-D Secure by Visa and SecureCode by MasterCard.
- The use of the secure protocol

V. MITIGATING FRAUD

In order to mitigate fraud in land administration, several measures can be applied. In this regards, security policy assumes the most import role in fraud mitigation measures. Information security policy is an overarching policy that sets the rules and requirements for security governance within the organisation. The policy shall be supported by specific security policies and procedures covering not only preventive measures but also responsive measures towards fraud related incidents.

Information security policy also binds security objectives with business objectives. The most basic security objectives in any information system include preservation of information confidentiality; provision of information integrity, ensuring availability of information at any time it is needed; and ensuring accountability to any faulty consequences. Lofstedt (2005) [11] also proclaims that the e-government security efforts must satisfy these basic security requirements in information system.

The next important phase in the process is the need for proper classification of information gathered through system administration and work processes. Such classification must be made in accordance to its value and the risk of various threats and vulnerabilities. Once classified, risk assessment strategies and activities are conducted in order to identify the gaps and risk treatment measures. According to Tang et al (2007) [19] among the highest system risks in e-government is malicious attack. Therefore, in addition to fraud, which is highly risky in the land administrative industry, attention must also be paid in reducing risk that is highly vulnerable in the electronic environment. Such attack can cause corruptions to the databases and in system applications. In this case, measures are needed to protect the key information gathered by all Land Offices pertaining to user details used for access control as well as the land title registration databases.

One important measure in protecting electronic data is by protecting the network of which the system operates. Benabdallah (2002) [3] has noted that to secure the internal network for managing and updating e-services, the government needs to provide adequate tools for authentication and identification of users. Digital signature and PKI appear to be good solutions. Digital certifications are mechanisms that can be applied to authenticate identity of users, identity of computer hosts or browsers, or a hybrid profile. According to Stalling (2003) [17], a digital signature is used to authenticate the message that comes from a particular sender. This is normally done by attaching a code that acts as a signature of the sender. This signature guarantees the source and the integrity of the message. With the implementation of a paperless or fully electronic land administration environment, digital certificates can be used for authorizing various administrative and user levels who seek to interact with the system. However, it is imperative that the digital certificates used are issued by Certification Authority in Malaysia such as Digicert and Trustgate, in order to enforce digital contracts and authorization, in alignment with the Digital Signature Act 1997 (Malaysian Communication and Multimedia Commission).

Encryption is another underlying technology to be used in land administration to ensure confidentiality and integrity of information. Information stored and transmitted over the network, wired or wireless, need to be encrypted to prevent unauthorized access and eventual fraudulent use of the information. The strength of encryption is determined by several factors, in which two of the main factors are the types of algorithm or cipher used, and the key length used during the encryption process.

In addition to the above recommendation, security controls also need to be implemented to provide a synergy between the policy and the technological solutions suggested. Security needs to begin with policy, before technology can be selected and implemented. However, prior to policy development and technology investment, risk assessment is the first step in valuation and prioritization of information asset.

VI. PROPOSED POLICY DIRECTION

The research has resulted in the suggested policy direction for the government in insuring more effective risk and security management activities. The following thirteen recommendations are provided for the JKPTG to address the issues found concerning security strategies in the Malaysian land administration context:

1) To develop and provide a mechanism that protects the system from fraud, preserves confidentiality, accountability and integrity, and at the same time makes information available for business continuity through security policy and strategies
2) To develop effective information security policy and strategies by taking into consideration the following factors:
    a. Formal governance
    b. Information classification
    c. Access control
    d. Communication and operations
    e. Physical security
    f. Personnel security
    g. Information system acquisition, development and maintenance
    h. Information security incident management
    i. Business continuity management
3) To establish a working committee that governs and establishes strategies, policies and procedures for the protection of the Critical Infrastructures and land information
4) To formalize information security governance led by top management
5) To conduct periodic security audit and risk assessment of existing as well as newly developed system such as eLAS or e-Tanah, for threats, vulnerabilities and impact associated to the risk on the asset.
6) To identify the factors that may results in eLAS risk and vulnerability such as types of fraud, malicious attacks etc. and formulate specific policies, strategies and technical resolutions in minimizing them
7) To provide adequate tools for assessment and evaluation of risks and potential threats to the networks and databases
8) To provide adequate tools for authentication and identification of users through Digital signature, digital authentication and PKI
9) To use encryption technology when storing and transmitting information over the network to prevent unauthorized access and ensure confidentiality and integrity of information
10) To use effective IT solutions in safeguarding against technical penetration to the network and databases such as biometric identification devices, a good encryption techniques in managing user id and password, and a Public Key Infrastructure (PKI)
11) To implement trust management policy and strategy on IT personnel who have direct access to databases. For instance, to certify or gazette IT personnel who can gain access to the databases through the backdoor channel similar to the role of a registrar
12) To provide guidelines and requirement specifications on information security made available for any online system in order to qualify the system as a secure system under security certification and for the system to be gazetted as secured and safe to use
13) To provide training and awareness programme on the importance of security management

VII. LESSONS LEARNED AND CONCLUSION

The existence of fraud may impose serious implication to the indefeasible title conceptualize by the Torrens System in land registration. The economic value and development of land highly depend on the security of title, which ensures the right to ownership upon transfer. Hence, this will ensure the security in the land market where various transactions can occur such as sales, purchases, loans, mortgages, etc, with full confidences from buyers and owners.

Fraud in land administration can take up many different forms. Fraud can occur in any land administration platform, which can be based on only manual or paper-based land administration system, or a combination of manual and paper-based land administration system, or a fully electronic land administration system. Overview of fraud indicates several different patterns, which can be categorized into types of frauds – fraud by forgery, fraud by false power of attorney, fraud by misleading victim into signing, fraud by false identity, and fraud by false alteration. Fraud can be further categorized into by whom it is committed - lawyers and solicitors, clerks and runners, family members, corporate representatives, administrators (i.e. land administrators, system administrators). Fraud can be done through forging of signature (the witness's or witness attest), misleading or inducing victim into signing the authorization form, altering the content of title

document, and pretending to be the person with the right to deal. Mortgage and transfer have been identified to be the most common transactions involving fraud.

Certain common theme in fraud or the so called enabling factor can be fraudulent individuals and relationship with the victims, fraudulent individuals and access to certificate of title and other identity documents, verification and identification procedures not followed (prosecute transfer without confirming with the victim), non-compliance with witnessing requirements, weak system involving the processes and procedures, and design of the technology with poor security procedures.

The use of the technology may minimise fraud that are common in the paper-based and partially computerised land administration system. Such technology must be properly designed with tight security procedures using various levels of authentication and verification techniques. Malaysia has the advantage of overcoming the issue of validation using the biometric thump print device. The application of such validation technique can give Malaysia an added advantage of developing and implementing the most secure system in land administration compared to many others worldwide.

On the other hand, the use of poor technology and poor strategies in handling or managing security issues may increase the risk of fraud with the electronic environment. In this regard, it is important to become aware of how fraud can happen even within the electronic environment. Future analysis should lead us to the detail of how fraud can take place with the use of technology. At this juncture, it is sufficient for us in giving the analysis of fraud and how it can be overcome with through a good design of the technology, and suggestion for legal or judiciary reform to enable the changes to take place. .

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